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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/592,943

09/15/2006

Hitoshi Saomoto

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38834

7590

09/17/2009

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EXAMINER

CARTER, MICHAEL W

ART UNIT

PAPER NUMBER

2828

NOTIFICATION DATE

DELIVERY MODE

09/17/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentmail@whda.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/592,943	<b>Applicant(s)</b> SAOMOTO ET AL.	
	<b>Examiner</b> MICHAEL CARTER	<b>Art Unit</b> 2828	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,12 and 13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,12 and 13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. **Claims 1-2 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,075,800 (Spear) in view of US Patent 6,618,420 (Gen-Ei) and further in view of US PG Pub 2003/0231685 (Nakamura).
3. **For claims 1 and 12**, Spear teaches a ridge waveguide laser with a ridge (figure 1, label 14) and two supports for protecting the ridge (figure 1, portion of label 10 to right of trough 12 and portion of label 10 to the left of trough 12) and the sidewalls of the support region extend directly downward into an underlying substrate (figure 1, label 11).
4. Gen-Ei teaches placing two lasers (figure 3a, labels 40 and 41) side by side with an isolation groove between them and on the outside edges, which extends into a substrate (label 10) in order to form a multi-beam laser (abstract).
5. It would have been obvious to one of ordinary skill in the art at the time the invention was made to form two of the lasers taught by Spear side by side as taught by Gen-Ei in order to form a multi-beam laser.
6. The above combination teaches a plurality of ridges (Spear, label 14 from 1st and second laser) arranged in parallel with each other (Gen-Ei figure 5B) inside a pair of first supports protecting said ridges (Spear, figure 1, label 12, support on the outside edge of each laser); a pair of second supports provided between said plurality of ridges

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and protecting said ridges (Spear, figure 1, label 12, support on the 1 side edge of each laser); a monitor region provided to the outermost edge of said semiconductor laser element (Gen-Ei, figure 3a, groove on outside edge of laser 41) and wherein sidewalls of said second supports (Spear, figure 1, sides of laser) extend directly downward into an underlying substrate (Spear, label 11) forming a second isolation groove (Gen-Ei groove between lasers 40 and 41) between said adjacent sidewalls.

7. While the combination does not explicitly teach the monitor region is to monitor progress of the etching and serves as an isolation groove, this recites an intended use which does not distinguish the structure from the prior art and has not been given patentable weight.

8. The combination does not teach a ratio of an area of said first and second supports relative to an area of said semiconductor laser element is set within a range from more than 33% to less than 52%.

9. However, Nakamura does teach a ratio of an area of said first and second supports relative to an area of said semiconductor laser element is set within a range from more than 33% to less than 52% (paragraph 73 teaches the width W in figure 2 is 30-40  $\mu\text{m}$  while the grooves 15 are 10  $\mu\text{m}$  and the wave guide is 2  $\mu\text{m}$ ) in order to provide a laser capable of high speed performance (abstract).

10. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the dimensions taught by Nakamura with the previous combination in order to provide a laser capable of high speed performance.

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11. Further, Spear teaches the supports are used to provide a thermal conduction path as well as mechanical stability between the chips and substrate (column 2, lines 23-25).

12. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to balance the size of the supports in order provide sufficient thermal conduction (See, for example, US PG Pub 2002/0024985 paragraph 23.) while maintaining sufficient high speed operations since a change in size is generally considered within the ordinary skill in the art.

13. **For claim 2**, the combination teaches each support of the pair of second supports is provided corresponding to each ridge. Each ridge (Spear, label 14) corresponds to a second support (support portion of label 10 for each laser between the ridges).

14. **Claims 13** is rejected under 35 U.S.C. 103(a) as being unpatentable over Spear in view Gen-Ei and Nakamura and further in view of US Patent 6,199,561 (Mitsubishi).

15. **For claim 13**, the combination of Spear, Gen-Ei and Nakamura teaches arranging a plurality of ridges in parallel with each other on an element surface (Gen-Ei, figure 3A, label 10) and providing each ridge with a plurality of supports to sandwich each ridge as discussed in the rejection of claim 1 above providing a block layer on surfaces of said ridges and said supports (Spear, figure 1, label 16) and providing an electrode layer covering the ridges (label 15).

16. Spear does not detail that the patterning (leaving the top of ridge 14 exposed to electrode 15) includes applying a protective film by spin coating to a surface of said

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block layer; removing said protective film covering a top surface of said ridges; with said protective film serving as a mask.

17. However Mitsuhashi teaches the steps of applying a protective film by spin coating to a surface of a layer; removing said protective film covering a top surface of a selected area; with said protective film serving as a mask are well known in the art for producing semiconductor devices (column 1, lines 14-24).

18. It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to use Mitsuhashi method of patterning for the patterning required in the method of the previous combination.

### ***Response to Arguments***

19. Applicant's arguments with respect to claims 1-2 and 12-13 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL CARTER whose telephone number is (571)270-1872. The examiner can normally be reached on Monday-Friday, 7:00 a.m.-4:30 p.m., EST.

21. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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22. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MC/

/Minsun Harvey/

Supervisory Patent Examiner, Art Unit 2828